

Poor helmet fit associated with concussion severity in high school football players

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High school football players with ill-fitting helmets are at greater risk for more severe concussions, according to a study presented today at the 2016 Annual Meeting of the American Academy of Orthopaedic Surgeons (AAOS).

"This study suggests that incorrect helmet fit may be one variable that predisposes a football player to sustain a more severe concussion," said senior study author Joseph Torg, MD, an orthopaedic surgeon specializing in sports medicine at Temple University Health System, who has identified acceptable tackle techniques for the NFL.

Attention has zeroed in on the persistent problem of concussions in [high school football](#); however, this study is the first to single out the impact of helmet fit based on a long period of study covering nine sports seasons from 2005 to 2014. Orthopaedic sports medicine experts analyzed information from 4,580 athletes ranging in age from 13 to 19. Data was obtained from the National High School Sports-Related Injury Surveillance System for players with first-time concussions.

Athletes who suffered concussions due to improper fitting helmets had higher rates of drowsiness, hyperexcitability and sensitivity to noise. Many of these athletes experienced more than one of the 13 concussive symptoms reviewed retrospectively in the study. In addition, athletes wearing helmets lined with air bladders suffered concussions that lasted longer.

"Correct helmet fit varies with helmet design, and players are encouraged to fit their equipment according to manufacturers' instructions," said study co-author Dustin Greenhill, MD, an orthopaedic surgery resident at Temple.

Dr. Greenhill explained that when helmets don't fit correctly, an athlete's cervical muscles in their neck and head may not be able to reduce the force of impact on the brain, especially when parts of the body rotate during high-speed hits. Helmet fit can change and evolve during the season and games, due to sweat, hair style, rain, cold weather clothing, and other factors.

"The risk factor of poor helmet fit should be minimized through mandated adult supervision and midseason spot checks," Dr. Greenhill said.

Provided by American Academy of Orthopaedic Surgeons

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